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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,206	06/06/2001	James Francis Crossland	BLD920010002	1287
30400	7590	07/22/2005	EXAMINER	
HESLIN ROTHENBERG FARLEY & MESITI P.C.			LEE, TOMMY D	
5 COLUMBIA CIRCLE			ART UNIT	
ALBANY, NY 12203			PAPER NUMBER	
			2624	

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/876,206	Applicant(s) CROSSLAND ET AL.	
	Examiner Thomas D. Lee	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-21, 23-33 and 35 is/are rejected.
- 7) ☒ Claim(s) 8-10, 22 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to applicant's amendment filed May 10, 2005.
Claims 1-35 are pending.

Response to Arguments

2. Applicant's arguments, see pages 9-11 of applicant's amendment, filed May 10, 2005, with respect to the prior rejection of claims 1-35 under 35 U.S.C. §112, second paragraph, and claim 23 under 35 U.S.C. §112, first paragraph, have been fully considered and are persuasive. The rejection of the claims under 35 U.S.C. §112 has been withdrawn.

Applicant's arguments filed in response to the prior rejection of claims 1-3, 11, 12, 16-18, 23, 24, 28, 30-32 and 35 under 35 U.S.C. §102(b), and claims 4-7, 13-15, 19-21, 25-27 and 33 under 35 U.S.C. §103(a), as set forth on pages 11-19 of applicant's amendment, have been fully considered but they are not persuasive. Applicant's arguments are based on the claims *as amended in response to the prior rejection*.

While the claims as amended overcome the prior rejection, they are not deemed to be allowable for the reasons set forth below.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1, 16 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,897,736 (Sugino).

Regarding claim 1, Sugino discloses a method of halftoning comprising: receiving input data comprising a first plurality of pels having a first plurality of intensities, wherein said first plurality of intensities (I_{in}) are chosen from K intensity values (pixels stored in frame memory in the form of a 4-bit signal representing 16 density levels ($K=16$) (column 3, lines 36-44)); converting the first plurality of pels having said first plurality of intensities into a second plurality of pels having a second plurality of intensities, wherein said second plurality of intensities (I_{out}) are chosen from L intensity levels, where $L < K$, and wherein the number of pels of the first plurality of pels is equal to the number of pels of the second plurality of pels (high- and low-density dots ($L=2$) stored in screen dot memory, accessed in response to the pixel density signal, in one-to-one correspondence according to a position signal, from frame memory (column 3, lines 44-51)); wherein at least some pels of said second plurality of pels are grouped into at least one basic cell each basic cell comprising n pels of said second plurality of pels (screen memory constitutes a conversion reference table for reading the position of a deformed dot matrix ($n=8$) (column 3, lines 52-62)); and wherein a total number of densities per each basic cell is greater than $(1 + n \times (L-1))$ for a full range of constant input intensities (0 to K) (I_{in}), and each said intensity out (I_{out}) is chosen without reference to an intensity out of a neighboring pel and n pels of the first plurality of pels contribute to the output intensities of the n pels within each basic cell (16 possible output densities per basic cell (Fig. 3A), $16 > (1 + 8 \times (2-1))$; no evidence in reference of neighboring pixel intensities contributing to the output intensity of an output pixel).

Claim 16 is a system claim corresponding to above-rejected method claim 1.

Claim 28 is an apparatus claims corresponding to method claim 1. The means or at least one computing unit for performing the method steps are disclosed in Sugino, as set forth above.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugino.

Claim 30 recites a machine-readable medium storing data representing sequences of instructions, which cause a processor to perform the steps previously recited in above-rejected method claim 1-3 and 11, respectively. While not disclosed in Sugino, it is well known in the art to store processing instructions, in general, in a memory, such as a computer disk, so that the processing steps may be read by a computer, enabling the computer to perform the processing instructions. It would have been obvious for one of ordinary skill in the art to provide processing instructions in a machine-readable medium, so that the process may be performed by a computer without the need for specific processing hardware.

7. Claims 11, 12, 14, 15, 23, 24, 26, 27, 29 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugino in view of U.S. Patent 5,805,305 (Abe).

Claims 11, 23, 29 and 35 further recite overlapping adjacent output dots within said basic cell. While not disclosed in Sugino, this limitation is disclosed in Abe (hem of Gaussian distribution profile protrudes into adjacent pixels (column 6, lines 4-16; Fig.

10)). In view of Abe, one of ordinary skill in the art would have recognized that because of the overlap of ON pixels, a plurality of densities can be achieved with the same number of ON pixels within a cell, by changing the position of the ON pixels, thus increasing the total number of density levels that may be realized for a given cell (column 6, lines 17-23). Sugino, in a manner similar to Abe, changes the position of ON pixels to provide an increased number of density levels, and while Sugino does not mention overlapping adjacent pixels, it would have been obvious in view of Abe that overlapping the pixels would produce the desired effect, regardless of the halftoning method used. Therefore, it would have been obvious for one of ordinary skill in the art to modify the teaching of Sugino by providing for pixel overlap within a cell, as disclosed on Abe.

Regarding claims 12 and 24, Sugino discloses producing said dots using a bilevel output device, wherein $L=2$ (dot matrix data from screen dot memory (bilevel data, note Fig. 2) supplied to a printer (column 3, lines 2-7)).

Regarding claims 14 and 26, Sugino discloses producing said dots using a color output device, and wherein a subset of said second plurality of pels comprises one of multiple color components reproduction of image data, each color component comprising an intensity out (lout) (column 2, lines 57-63).

Regarding claims 15 and 27, Sugino discloses a bilevel output device (dot matrix data from screen dot memory (bilevel data, note Fig. 2) supplied to a printer (column 3, lines 2-7)).

8. Claims 2, 3, 5, 6, 17, 18, 20, 21, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugino as applied to claims 1, 16 and 30 above, and further in view of Abe.

Regarding claims 2, 17 and 31, Sugino does not disclose employing said second plurality of intensities (I_{out}) to place dots within each basic cell, wherein adjacent dots overlap within said basic cell. As mentioned above, this limitation is disclosed in Abe (hem of Gaussian distribution profile protrudes into adjacent pixels (column 6, lines 4-16; Fig. 10)). In view of Abe, one of ordinary skill in the art would have recognized that because of the overlap of ON pixels, a plurality of densities can be achieved with the same number of ON pixels within a cell, by changing the position of the ON pixels, thus increasing the total number of density levels that may be realized for a given cell (column 6, lines 17-23). Sugino, in a manner similar to Abe, changes the position of ON pixels to provide an increased number of density levels, and while Sugino does not mention overlapping adjacent pixels, it would have been obvious in view of Abe that overlapping the pixels would produce the desired effect, regardless of the halftoning method used. Therefore, it would have been obvious for one of ordinary skill in the art to modify the teaching of Sugino by providing for pixel overlap within a cell, as disclosed on Abe.

Regarding claims 3, 18 and 32, Sugino discloses producing said dots using a bilevel output device, wherein L=2 (dot matrix data from screen dot memory (bilevel data, note Fig. 2) supplied to a printer (column 3, lines 2-7)).

Regarding claims 5 and 20, Sugino discloses producing said dots using a color output device, and wherein a subset of said second plurality of pels comprises one of multiple color components reproduction of image data (column 2, lines 57-63).

Regarding claims 6 and 21, Sugino discloses a bilevel output device (dot matrix data from screen dot memory (bilevel data, note Fig. 2) supplied to a printer (column 3, lines 2-7)).

9. Claims 4, 7, 13, 19, 25 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugino in view of Abe as applied to claims 2, 5, 11, 17, 23 and 31 above, and further in view of Sakurada et al.

Abe does not disclose producing said dots using a multilevel output device, where $L > 2$. However, Sakurada et al. disclose a method whereby the number of output levels for each color of an output image is 3 (no density, low density and high density (column 2, line 17 – column 3, line 2; Fig. 1)). One of ordinary skill in the art would have recognized in view of Sakurada et al. that providing a greater number of output levels effectively increased the reproduction range of an output device, thereby enhancing the tonal quality of an output image, regardless of the halftoning method used. Therefore, it would have been obvious for one of ordinary skill in the art to modify the teaching of Abe by performing conversion of image data to more than two output levels, as disclosed in Sakurada et al.

Allowable Subject Matter

10. Claims 8-10, 22 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: No prior art has been found to disclose or suggest point-wise thresholding using multiple threshold matrices to convert said first plurality of pels into said second plurality of pels without considering a neighboring pel, as recited in claims 8, 22 and 34, in combination with the conversion of pels as recited in corresponding base claims 1, 16 and 30.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (571) 272-7436. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
July 19, 2005